Complete Summary

GUIDELINE TITLE

Forearm, wrist, & hand (acute & chronic).

BIBLIOGRAPHIC SOURCE(S)

Work Loss Data Institute. Forearm, wrist, & hand. Corpus Christi (TX): Work Loss Data Institute; 2005. 69 p. [75 references]

GUIDELINE STATUS

Note: This guideline has been updated. The National Guideline Clearinghouse (NGC) is working to update this summary.

** REGULATORY ALERT **

FDA WARNING/REGULATORY ALERT

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory information has been released.

On April 7, 2005, the U.S. Food and Drug Administration (FDA) asked manufacturers of non-prescription (over the counter [OTC]) non-steroidal anti-inflammatory drugs (NSAIDs) to revise their labeling to include more specific information about potential gastrointestinal (GI) and cardiovascular (CV) risks, and information to assist consumers in the safe use of the drugs. See the FDA Web site for more information.

Subsequently, on June 15, 2005, the FDA requested that sponsors of all NSAIDs make labeling changes to their products. FDA recommended proposed labeling for both the prescription and OTC NSAIDs and a medication guide for the entire class of prescription products. See the FDA Web site for more information.

COMPLETE SUMMARY CONTENT

IDENTIFYING INFORMATION AND AVAILABILITY
DISCLAIMER

SCOPE

DISEASE/CONDITION(S)

Work-related injuries of forearm, wrist, and hand, not including carpal tunnel syndrome

GUIDELINE CATEGORY

Diagnosis
Evaluation
Management
Treatment

CLINICAL SPECIALTY

Chiropractic
Family Practice
Internal Medicine
Orthopedic Surgery
Physical Medicine and Rehabilitation

INTENDED USERS

Advanced Practice Nurses
Health Care Providers
Health Plans
Nurses
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

To offer evidence-based step-by-step decision protocols for the assessment and treatment of workers' compensation conditions

TARGET POPULATION

Workers with occupational injuries of the forearm, wrist, and hand (excluding carpal tunnel syndrome)

INTERVENTIONS AND PRACTICES CONSIDERED

The following interventions/procedures were considered and recommended as indicated in the original guideline document:

1. Activity restrictions/work modifications

2. Arthrodesis (fusion)
3. Cold/heat packs
4. Computed tomography (CT)
5. Continuous passive motion (CPM)
6. Corticosteroid injections
7. Dupuytren's release/fasciectomy
8. Exercises
9. Fasciotomy for compartment syndrome
10. Magnetic resonance imaging (MRI)
11. Nonprescription medication: acetaminophen, non-steroidal anti-inflammatory drugs (NSAIDs)
12. Occupational therapy/physical therapy
13. Plaster casting
14. Radiography
15. Return to work
16. Trapeziectomy
17. Triangular fibrocartilage complex (TFCC) reconstruction
18. Trigger finger surgery
19. Vitamin C
20. Yoga

The following interventions/procedures are under study and are not specifically recommended:

1. Casting versus splinting
2. Ergonomic interventions
3. Mallet finger injuries (treatment)

The following interventions/procedures were considered, but are not recommended:

1. Acupuncture
2. Arthroplasty (joint replacement)
3. Chiropractic/manipulation
4. De Quervain's tenosynovitis surgery
5. Immobilization/rest as primary treatment
6. Surgery for broken wrist (in the absence of displacement or delayed healing)
7. Transcutaneous electrical neurostimulation (TENS)

MAJOR OUTCOMES CONSIDERED

Effectiveness of treatments in relieving pain, improving stability, and restoring normal function

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Ranking by quality within type of evidence:

a. High Quality
b. Medium Quality
c. Low Quality

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

Guideline developers reviewed published cost analyses.

METHOD OF GUIDELINE VALIDATION

Not stated

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not applicable

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Note: This guideline has been updated. The National Guideline Clearinghouse (NGC) is working to update this summary. The recommendations that follow are based on the previous version of the guideline.

Initial Diagnosis

1. Determine the type of injury or contributing factors (direct trauma, fall, repetitive motion, twisting incident, etc.)
2. Determine whether the problem is acute, subacute, chronic, or of insidious onset.
3. Record the severity and specific anatomic location of the pain asserted.
4. Assess the ability of the patient to use the forearm, wrist, or hand, from no to full ability.
5. Search for any evidence of an open or penetrating wound.
6. Search for any evidence of deformity (anterior/posterior or lateral/medial) of the wrist.
7. Test the range-of-motion of the joint (normal, mild restriction, severe restriction, or complete restriction).
8. Record any present medication.
9. Elicit any previous medical history, history of systemic disease, or previous wrist injury or disability.

Presumptive Diagnosis

- Fracture or Dislocation (see original guideline document for ICD-9 codes for this and other diagnoses)
- Other diagnoses:
    - Sprain, sprain-fracture or contusion, excluding carpal tunnel syndrome (see separate chapter)
    - Laceration
    - Tenosynovitis

Fracture or Dislocation of Wrist

A. Definitive Evaluation
    - Record a history of the cause of injury.
    - Search for any evidence of an open wound in the vicinity of the injury.
    - Perform a clinical examination for deformity, tenderness, or ecchymosis, or associated nerve, neurovascular, or tendon injury.
    - Check for snuff box tenderness.
    - Search for any evidence of dislocation or arterial vascular compromise (cold, dusky hand with loss of sensation). If found, an immediate reduction should take place (prior to x-rays, if necessary, or proper consultations).
    - Perform an evaluation for an associated injury of the wrist or fingers.
    - X-ray the wrist. Include a navicular view.

- Consider the easily missed scapholunate dissociation, or scaphoid fracture.

B. Initial Therapy
    1. Simple, undisplaced, stable fractures of the wrist can be treated by the primary care physician.
        a. Place the wrist in a plaster or sugar tong splint for seven to ten days, and then change to a short arm cast.
        b. Ice prior to application of cast, if applicable, and elevate for 4 to 7 days to prevent or reduce swelling (Hand Higher than Heart - HHH).
        c. Give the patient instructions to prevent tight cast problems.
        d. Analgesics and/or nonsteroidal anti-inflammatory drugs for up to two weeks may be appropriate.
        e. Recheck at seven days and then at two-week intervals until healed. Repeat x-rays at seven days and at two weeks to assure that the fracture has not slipped. x-ray again at five weeks; in most cases, the cast can be removed at that time.
        f. Estimate a return-to-work date for temporary transitional and regular work at each visit.
        g. Prescribe temporary transitional and job modifications at each visit.

    2. Undisplaced navicular fractures can be treated by the primary care physician.
        a. With a negative x-ray but clinical suspicion of a navicular fracture (i.e., localized pain at snuff box following fall/trauma), a short arm thumb spica cast is used for seven to ten days. Then a repeat x-ray out of plaster is obtained to clarify the diagnosis. Rarely is a bone scan useful to confirm a suspected diagnosis of navicular fracture.
        b. Confirmed navicular fractures should be immobilized in a short arm thumb spica cast for 10 to 12 weeks until healed by x-ray examination.
        c. Analgesics and/or nonsteroidal anti-inflammatory drugs for up to two weeks may be appropriate.
        d. Recheck at seven days and then at two-week intervals until healed. Treatment may be as long as 12 to 36 weeks.
        e. Wrist x-rays should be taken at four to six weeks. It is often necessary to remove the cast to obtain the quality of x-rays necessary to determine healing status. Persistent fracture line on the x-ray and continued clinical tenderness over the navicular suggest delayed union that should prompt referral.
        f. Estimate a return-to-work date for temporary transitional and regular work at each visit.
        g. Prescribe temporary transitional and job modifications at each visit, and maybe a brace to prevent re-injury.

    3. Minimally displaced fractures can be reduced and treated by a primary care physician with proper training.
        a. Patients with minimally displaced fractures and no loss of length can have local anesthesia injected into the fracture; then

the physician can perform a reduction. Parenteral analgesic will facilitate the reduction.

b. Ice prior to application of cast, if applicable, and elevate for up to seven days is appropriate to prevent or reduce swelling.
c. Apply a sugar tong splint with an ace bandage. Replace with a short arm cast after seven days or when swelling has subsided.
d. Give the patient instructions to prevent tight cast problems.
e. Analgesics and/or nonsteroidal anti-inflammatory drugs for up to two weeks may be appropriate.
f. Recheck at seven days and then at two-week intervals until healed.
g. Obtain x-rays after reduction, seven to ten days, and at four weeks.
h. Physical therapy (three to four visits) to teach patient range-of-motion and muscle-strengthening exercises is appropriate following removal of cast.
i. Estimate a return-to-work date for temporary transitional and regular work at each visit.
j. Prescribe temporary transitional and job modifications at each visit.

Wrist fractures with any question of non-union and all other wrist fractures not described above should be referred to an orthopedic surgeon for care.

Evaluate for delayed union, malalignment, or signs of associated tendon or nerve injury.

Promptly refer to an orthopedic surgeon if one of these conditions is found, otherwise continue therapy.

Official Disability Guidelines (ODG) Return-To-Work Pathways - Fracture of Carpal Bone(s)

Stable, clerical/modified work: 1 day

Stable, manual work: 7 days

Reduction/manipulation, clerical/modified work: 7 days

Reduction/manipulation, manual work: 21 days

Reduction/manipulation, heavy manual work: 56 days

ODG Return-To-Work Pathways - Fracture of Radius and Ulna

Stable, clerical/modified work: 2 days

Stable, manual work: 14 days

Reduction/manipulation, clerical/modified work: 14 days

Reduction/manipulation, manual work: 28 days

Reduction/manipulation, heavy manual work: 42 days

Open surgery, clerical/modified work: 21 days

Open surgery, manual work: 56 days

Open surgery, heavy manual work: 112 days

ODG Return-To-Work Pathways - Dislocation of Wrist

Non-dominant arm, clerical/modified work: 0 days

Non-dominant arm, manual work: 14 days

Non-dominant arm, heavy manual work: 35 days

Dominant arm, clerical/modified work: 7 days

Dominant arm, manual work: 42 days

Dominant arm, heavy manual work: 63 days

(See ODG Capabilities & Activity Modifications for Restricted Work under "Work" in the Procedure Summary of the original guideline document)

Other Diagnoses

- Record a history including the onset of symptoms, limitations of present activity, and history of previous episodes, including type of treatment and results.
- The history should include the nature of symptoms (numbness, pain, tingling), the time of day symptoms are experienced, and how the pain is relieved.
- Separate cases of true nerve root impairment from those that mimic carpal tunnel syndrome (CTS). These include sprains, tenosynovitis, contusions, and hand arm vibration syndrome (HAV).
- X-rays are not usually needed, unless local pathology or referred pain in the wrist from cervical spine pathology is suspected or the case is persistent. In such cases, wrist or cervical spine x-rays are appropriate.
- Order laboratory studies including glycohemoglobin, sedimentation rate, thyroid-stimulating hormone (TSH), and a Rheumatoid Factor, if appropriate.
    - The initial evaluation of the wrist needs to include a careful history for type of injury and the possibility of both repetitive microtrauma and vibration type injuries. It is extremely important to make sure that any painful injury of the wrist does not have its origin in the upper extremity or the neck. It is also important to evaluate the patient's

history for avocational activities that may be the cause of or be aggravating the problem, as it is necessary to have the patient modify these activities if one is to successfully treat the problem.

- The presumptive diagnosis is used to classify the type of problem prior to a thorough evaluation. Subsequent to a thorough evaluation, the diagnosis may change (e.g., if the physician classifies a patient with a sprain and the x-rays subsequently show a fracture). In such a case, therapy should follow the subsequent rather than the initial diagnosis.
- An open wound in the vicinity of a fracture makes it a compound fracture, even if no clear connection to the fracture site is apparent. All compound fractures should be referred to an orthopedic surgeon for care.
- Snuff box tenderness is often a sign of injury to the scaphoid bone. If symptoms persist for seven days or longer, repeated navicular view x-rays should be taken.
- Trans-scaphoid perilunar dislocation is a rare, severe injury which should be referred to an orthopedic surgeon.
- Scapholunate dissociation is the most frequent serious ligamentous injury of the wrist and is diagnosed by the "Terry Thomas sign" on wrist x-rays. There is a widening of the space between the lunate and the scaphoid on the anteroposterior view.
- Magnetic resonance imaging (MRI) of the wrist shows:
    - 82% of triangular fibrocartilage tears confirmed by arthroscopy (Injuries to the triangular fibrocartilage complex are a frequent cause of ulnar-sided wrist pain. The TFC is a complex structure that involves the central fibrocartilage articular disc, merging with the volar edge of the ulnocarpal ligaments and, at its dorsal edge, with the floors of the extensor carpi ulnaris and extensor digiti minimi.)
    - 50% of scapholunate ligament tears
    - 40% of intercarpal dorsal ligament tears
- Arthroscopy is thought to be superior to arthrograms in delineating ligament tears.
- Fluoroscopy exam is helpful in diagnosing tears and abnormal motion.
- Undisplaced navicular fractures can be treated by the primary care physician. Those navicular fractures that are displaced or have a wide gap between the fragments should be immediately referred to an orthopedic surgeon, as they have a significant increased incidence of nonunion.
- Wrist sprains are common industrial injuries, and must be differentiated from carpal tunnel syndrome and tendonitis.
- Tendon injuries are not common with sprains, but it is important to check for such injuries as they require different therapy than a simple sprain.
- Grade III sprains involve tears of the carpal ligaments and are impairing injuries. Clinically they have significant swelling, ecchymosis, and an unstable joint. These are the sprains that are more likely to have associated injury of tendons or nerves. Injuries to the triangular fibrocartilage complex (TFCC) may have pain and stiffness as the only relevant findings. These injuries should be referred to an orthopedic surgeon or hand surgeon for evaluation and treatment.
- A wrist splint or short arm cast is sometimes necessary for the initial treatment of sprains which are very tender, swollen, and painful with

motion. Splinting is continued until symptoms abate. An early nonresisted exercise program is indicated.

- The Terry Thomas sign refers to the x-ray appearance of a widening gap between the two carpal bones of the wrist in patients with scapholunate dissociation. (Terry Thomas's teeth were apart when he smiled).
- Imaging procedures are appropriate for sprains that have been treated for six weeks with little or no improvement in the patient's complaints or physical findings. Repeat x-rays with navicular views are indicated, since routine anteroposterior and lateral x-rays generally fail to demonstrate navicular fractures. Additionally, an arthrogram may be of value to demonstrate carpal ligament tears and help determine the necessity of surgical therapy, but should be obtained only after a consultation with an orthopedic surgeon.
- A laceration produced by crush injury needs an x-ray to rule out any underlying fracture and to answer any question of penetration of the joint or a foreign body in the wound.
- Neurovascular and tendon function need evaluation with any laceration around a joint. No anesthesia should be used in the wound until the sensation has been checked distal to the laceration and the function of the tendons has been identified as intact.
- Antibiotic therapy for contaminated lacerations should include both anti-staphylococcal and broad-spectrum coverage.
- Tenosynovitis is a common enthesopathy of the tendon of the wrist. It is most important to rule out infection, for this is an emergent problem that requires prompt referral. Infectious tenosynovitis will usually demonstrate marked tenderness and more pain than noninfectious tenosynovitis. The patient with septic tenosynovitis will frequently have an elevated temperature, lymphangitis, erythematous swelling, and severe pain with attempted motion along with an elevated white blood count.
- Ganglions of the wrist are benign synovial cysts and usually do not require treatment. An initial aspiration with injection of corticosteroids is acceptable. There is a 50% recurrence rate. With an accurate diagnosis, no further treatment is necessary. Surgery, though commonly done, has a significant recurrence rate and is only indicated in unusually symptomatic wrists.
- Placing the wrist in a splint post injection for a short time is often helpful.
- Hand arm vibration syndrome (HAV) is a relatively common industrial injury in workers whose job involves work with frequent and sustained vibrations. Sensory impairment of the fingers and Raynaud's phenomenon are the common complaints. It must be differentiated from carpal tunnel syndrome, as the treatment is never surgical for HAV. The treatment is primarily reduction of vibration exposure and taking a slow release calcium channel blocker (e.g., nifedipine).
- Acute carpal tunnel syndrome (CTS) occasionally occurs with acute trauma to the wrist, most commonly with severe sprains. It can occur in fractures and with a direct blow to the volar aspect of the wrist. There is rapid and intense development of symptoms with paresthesias, pain, and numbness in the distribution of the median nerve. This is an urgent (four to eight hours) surgical problem. It can

be differentiated from other problems by the measurement of the pressure in the carpal tunnel.

- Acute episodes of traumatic arthritis frequently follow minor wrist fractures and severe sprains. One of the common sites of traumatic arthritis of the wrist is the trapeziometacarpal joint at the base of the first metacarpal. Persistent and increasing impairment of this joint from arthritis often requires surgical treatment.

ODG Return-To-Work Pathways - Sprains and Strains of Wrist and Hand

Mild, clerical/modified work: 0 days

Mild, manual work: 5 days

Moderate, clerical/modified work: 7 days

Moderate, manual work: 21 days

Severe, clerical/modified work: 10 days

Severe, manual work: 35 days

ODG Return-To-Work Pathways - Contusion of Upper Limb

Superficial contusions: 0 days

Deep contusions, clerical/modified work: 5 days

Deep contusions, manual work: 21 days

ODG Return-To-Work Pathways - Open Wound of Elbow, Forearm, and Wrist

Minor: 0 days

Major, clerical/modified work: 3 days

Major, manual work: 8 days

Tendon repair, clerical/modified work: 14 days

Tendon repair, manual work: 91 days

ODG Return-To-Work Pathways - Trigger Finger

Medical treatment: 0 days

Surgical release, clerical/modified work: 14 days

Surgical release, manual work: 28 days

ODG Return-To-Work Pathways - Radial Styloid Tenosynovitis

Medical treatment, clerical/modified work: 0-1 days

Medical treatment, manual work: 10 days

Medical treatment, regular work if cause of disability: 42 days

Medical treatment, heavy manual work: 56 days

Surgical release, clerical/modified work: 14 days

Surgical release, manual work: 42 days

ODG Return-To-Work Pathways - Other Tenosynovitis or Hand and Wrist

Medical treatment, clerical/modified work: 0 days

Medical treatment, manual work: 21 days

Medical treatment, heavy manual work: 35 days

Surgical treatment, clerical/modified work: 7 days

Surgical treatment, manual work: 21 days

ODG Return-To-Work Pathways - Ganglion and Cyst of Synovium, Tendon, and Bursa

Asymptomatic: 0 days

Aspiration, clerical/modified work: 0 days

Aspiration, manual work: 3 days

Excision of wrist ganglion, clerical/modified work: 7 days

Excision of wrist ganglion, manual work: 14 days

Excision of wrist ganglion, manual work, dominant arm: 14-21 days

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

During the comprehensive medical literature review, preference was given to high quality systematic reviews, meta-analyses, and clinical trials over the past ten years, plus existing nationally recognized treatment guidelines from the leading specialty societies.

The type of evidence associated with each recommended or considered intervention or procedure is ranked in the guideline's annotated reference summaries.

Ranking by Type of Evidence:

1. Systematic Review/Meta-Analysis
2. Controlled Trial-Randomized (RCT) or Controlled
3. Cohort Study-Prospective or Retrospective
4. Case Control Series
5. Unstructured Review
6. Nationally Recognized Treatment Guideline (from www.guideline.gov)
7. State Treatment Guideline
8. Foreign Treatment Guideline
9. Textbook
10. Conference Proceedings/Presentation Slides

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

These guidelines unite evidence-based protocols for medical treatment with normative expectations for disability duration. They also bridge the interests of the many professional groups involved in diagnosing and treating work-related injuries of the forearm, wrist, and hand.

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

The Treatment Protocol sections outline the most common pathways to recovery, but there is no single approach that is right for every patient and these protocols do not mention every treatment that may be recommended. See the Procedure Summaries (in the original guideline document) for complete lists of the various options that may be available, along with links to the medical evidence.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Work Loss Data Institute. Forearm, wrist, & hand. Corpus Christi (TX): Work Loss Data Institute; 2005. 69 p. [75 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2004 (revised 2006)

GUIDELINE DEVELOPER(S)

Work Loss Data Institute - Public For Profit Organization

SOURCE(S) OF FUNDING

Not stated

GUIDELINE COMMITTEE

Not stated

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Not stated

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

Note: This guideline has been updated. The National Guideline Clearinghouse (NGC) is working to update this summary.

GUIDELINE AVAILABILITY

Electronic copies of the updated guideline: Available to subscribers from the Work Loss Data Institute Web site.

Print copies: Available from the Work Loss Data Institute, 169 Saxony Road, Suite 210, Encinitas, CA 92024; Phone: 800-488-5548, 760-753-9992, Fax: 760-753-9995; www.worklossdata.com.

AVAILABILITY OF COMPANION DOCUMENTS

Background information on the development of the Official Disability Guidelines of the Work Loss Data Institute is available from the Work Loss Data Institute Web site.

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI on April 4, 2005. This NGC summary was updated by ECRI on January 18, 2006, and on April 11, 2006.

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Date Modified: 10/9/2006